

Towards FAIR and open energy data for the low carbon transition





What for EERAdata? Supporting a human-centred, sustainable digitalization of the energy sector

NUMBERS BY MARY CORNISH

I like the generosity of numbers.
The way, for example,
they are willing to count
anything or anyone:
two pickles, one door to the room,
eight dancers dressed as swans.

I like the domesticity of addition—
add two cups of milk and stir—
the sense of plenty: six plums
on the ground, three more
falling from the tree.

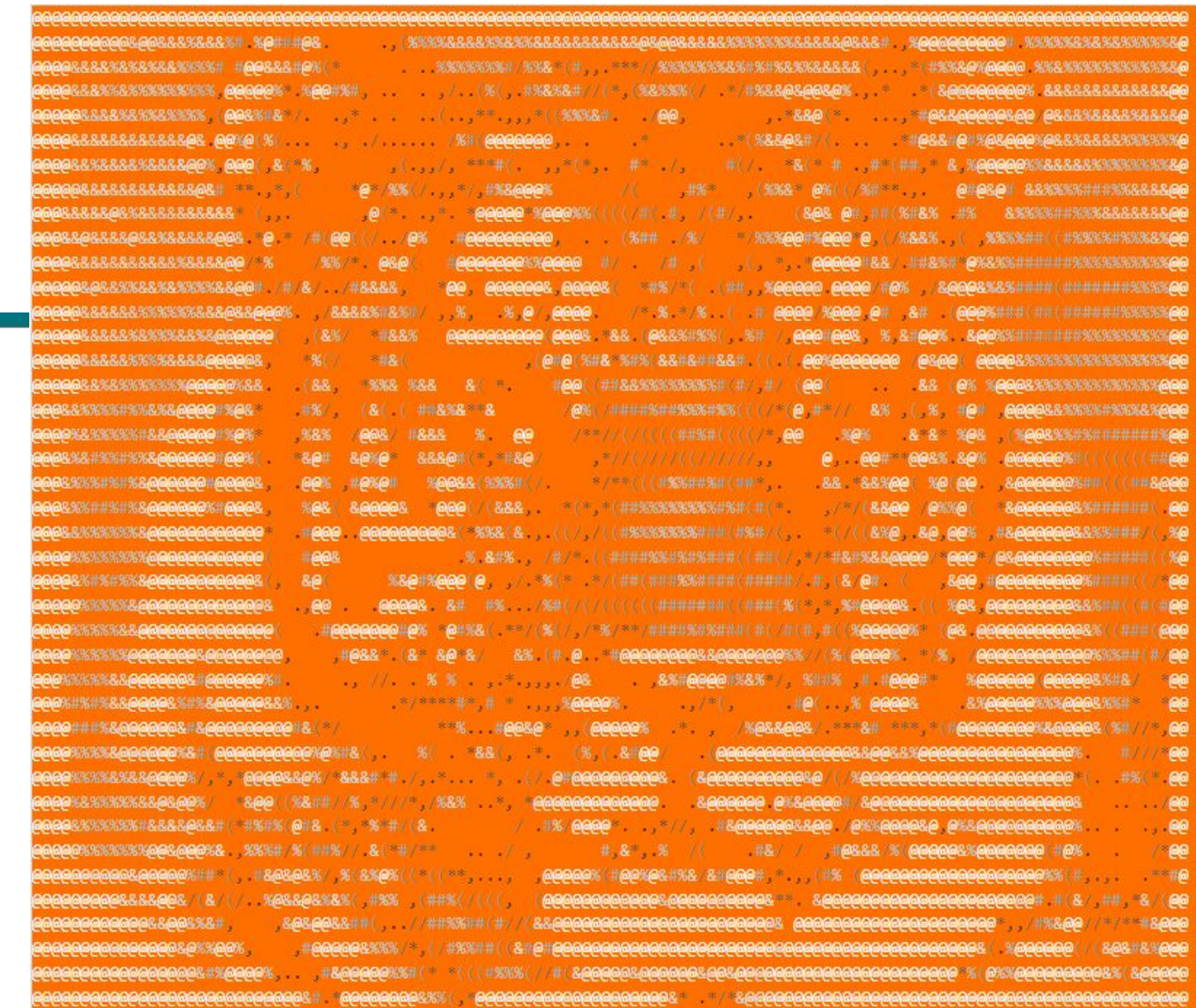
And multiplication's school
of fish times fish,
whose silver bodies breed
beneath the shadow
of a boat.

Even subtraction is never loss,
just addition somewhere else:
five sparrows take away two,
the two in someone else's
garden now.

There's an amplitude to long division,
as it opens Chinese take-out
box by paper box,
inside every folded cookie
a new fortune.

And I never fail to be surprised
by the gift of an odd remainder,
footloose at the end:
forty-seven divided by eleven equals four,
with three remaining.

Three boys beyond their mother's call,
two Italians off to the sea,
one sock that isn't anywhere you look.



CC Schwanitz

Community workshops

First Year *Define*

Concepts

Workshop I

FAIR & Open Energy Data
June 2020. Community building.

Workshop II

Metadata concept
30.11.-7.12. 2020.

Second Year *Implement*

Ecosystem, culture, skills

Workshop III

FAIRification put into practice
Characterization of data and
development of workflows.

Workshop IV

Supporting technologies
Fair & open energy data
infrastructure.

Third Year *Embed & Sustain*

Incentives

Workshop V

Sustainable models
From licensing to business m.

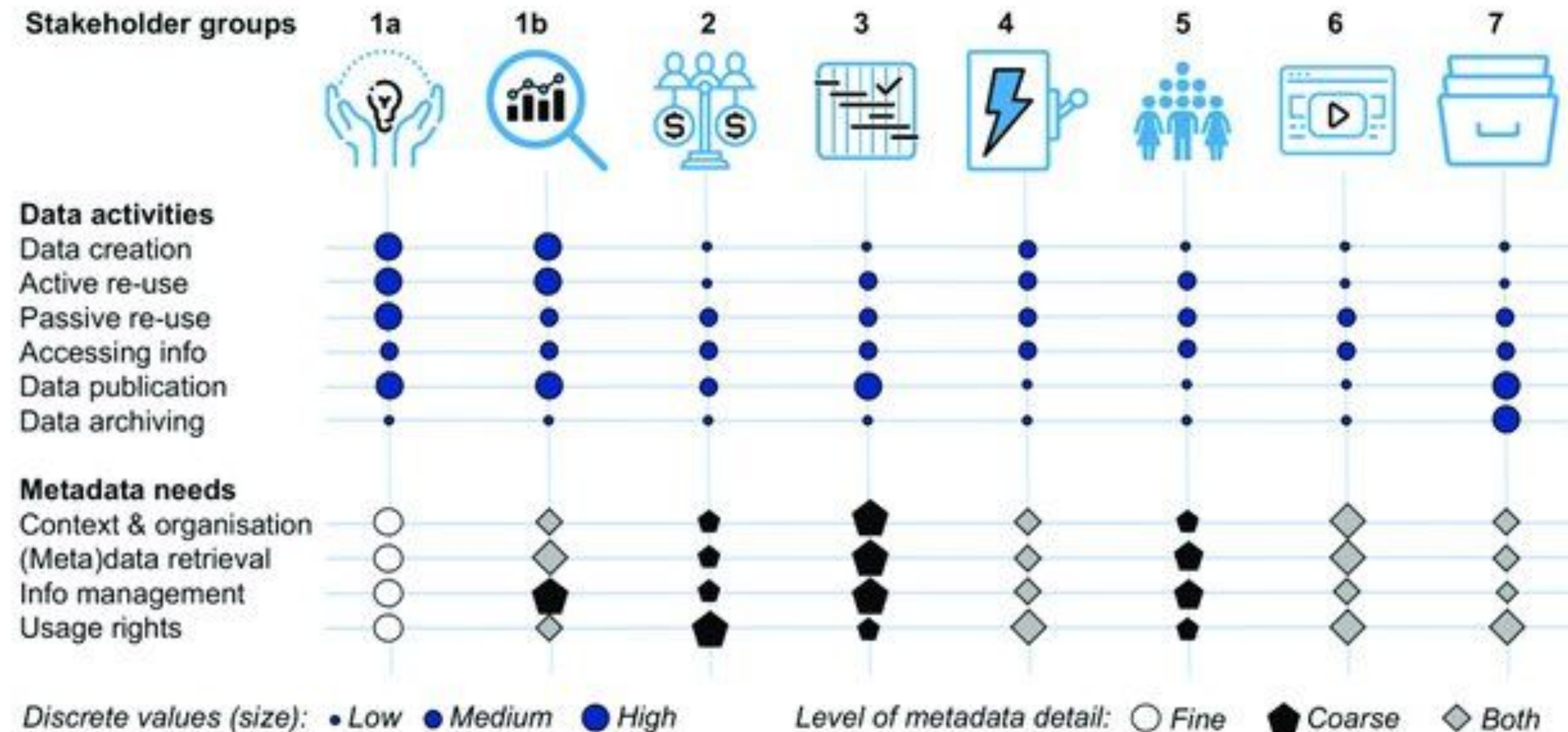
Workshop VI

*New trends in open science &
steps beyond EERAdata*

Towards FAIR Metadata Standards for Low Carbon Energy Research

Data activities and metadata needs for each stakeholder group.

1a: Energy domain experts, 1b: Interdisciplinary scientists; 2: Funders of energy R&D activities; 3: Planners & decision-makers; 4: Energy & other industries; 5: General public; 6: Data scientists; and 7: Publishers, librarians, and other data curators.



Result: Community Paper
<https://doi.org/10.33390/en14206692>

Current state and call for action to accomplish FAIR in the domain

Result: Consortium Paper
Accepted for Nature Scientific Reports

Test results – No.



0
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72

FAIR maturity indicators tested (Wilkinson 2019)

- A2 – Metadata persistence
- F3 – Metadata identifier explicitly in metadata
- F1 – Data identifier persistence
- I1 – Data knowledge representation language (strong)
- F4 – Searchable in major search engine
- F1 – Identifier persistence
- I1 – Data knowledge representation language (weak)
- R1.1– Metadata includes license (weak)
- R1.1– Metadata includes license (strong)
- A1.1– Uses open free protocol for data retrieval
- A1.2– Data authentication and authorization
- F3 – Data identifier explicitly in metadata
- I2 – Metadata uses FAIR vocabularies (strong)
- I2 – Metadata uses FAIR vocabularies (weak)
- I3 – Metadata contains qualified outward references
- I1 – Metadata knowledge representation language (weak)
- I1 – Metadata knowledge representation language (strong)
- F2 – Structured metadata
- F2 – Grounded metadata
- A1.1– Uses open free protocol for metadata retrieval
- A1.2– Metadata authentication and authorization
- F1 – Unique identifier

Number of databases complying with FAIR maturity indicators as operationalized in Wilkinson et al. (2019) that test 13 of 15 FAIR principles. The results are based on machine-actionability tests for 80 databases that are representative of data flows for low carbon energy research. None of the tested databases achieves persistence of metadata and data identifiers. Internal linking of metadata with the help of identifiers is equally problematic.



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WS4

Workshop No.4: Supporting technologies for FAIRification

The fourth EERAdat Workshop is a 3-day event taking place from **Tue 15 - Thu 17 March, 2022**. It is conceived as a hands-on workshop and discussion event complemented with external inputs given by invited contributors. Organized as a hybrid meeting, the workshop will be hosted by the AIT Austrian Institute of Technology (physical meeting in Vienna) and by the EERA Secretariat (online meeting). Given the expected pandemic-related restrictions and safety regulations, only a core group of the EERAdat project team will gather in person at the AIT. All other participants will be able to participate online upon registration.

Contents [\[hide\]](#)

- 1 Objectives
- 2 Read & watch aheads
- 3 Programme - 15 March 2022
- 4 Programme - 16 March 2022
- 5 Programme - 17 March 2022

Objectives

- Explore and discuss tools that support a FAIR and open database infrastructure
- Agree on supporting technologies to be implemented, work on the community platform concept

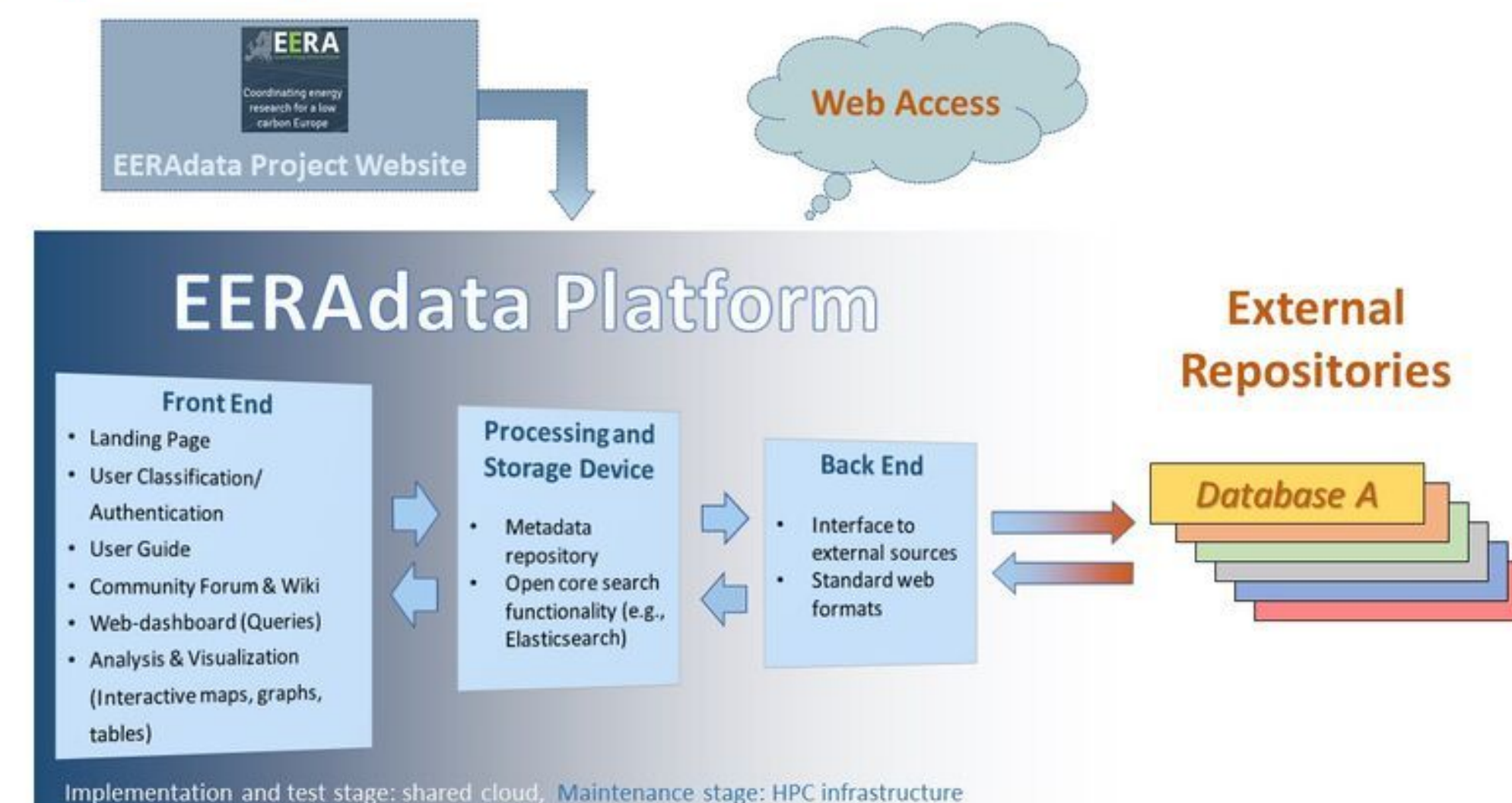
Read & watch aheads

In preperation of WS4, four Mini-Workshops where held from the 6th December 2021 to the 17th December 2021.

The content of these workshops can be found here: [Mini-Workshops](#)

4th EERAdat workshop

**Second Year
Implement**





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www.eeradata.eu

Credits & sources

Community paper: Wierling, August, Valeria J. Schwanitz, Sebnem Altinci, Maria Bałazińska, Michael J. Barber, Mehmet E. Biresselioglu, Christopher Burger-Scheidlin, Massimo Celino, Muhittin H. Demir, Richard Dennis, Nicolas Dintzner, Adel el Gammal, Carlos M. Fernández-Peruchena, Winston Gilcrease, Paweł Gładysz, Carsten Hoyer-Klick, Kevin Joshi, Mariusz Kruczek, David Lacroix, Małgorzata Markowska, Rafael Mayo-García, Robbie Morrison, Manfred Paier, Giuseppe Peronato, Mahendranath Ramakrishnan, Janeita Reid, Alessandro Sciullo, Berfu Solak, Demet Suna, Wolfgang Süß, Astrid Unger, Maria L. Fernandez Vanoni, and Nikola Vasiljevic. 2021. "**FAIR Metadata Standards for Low Carbon Energy Research—A Review of Practices and How to Advance**" *Energies* 14, no. 20: 6692.
<https://doi.org/10.3390/en14206692>

Consortium paper: Valeria Jana Schwanitz, August Wierling, Mehmet Efe Biresselioglu, Massimo Celino, Muhittin Hakan Demir, Maria Bałazińska, Mariusz Kruczek, Manfred Paier and Demet Suna. **Current state and call for action to accomplish findability, accessibility, interoperability, and reusability of low carbon energy data.** Accepted for publication in *Nature Scientific Reports*.

Project WIKI: <https://eeradata-platform.eu/wiki/>



TOWARDS A FAIR AND OPEN DATA
ECOSYSTEM IN THE LOW-CARBON
ENERGY RESEARCH COMMUNITY